

FARM Facts

Annual ryegrass production

Introduction

Two types of annual ryegrasses (*Lolium multiflorum*) are grown in Saskatchewan: Italian ryegrass is a biennial from northern Italy, where it is primarily used for winter hay and pasture; Westerwolds ryegrass is an annual that was developed from Italian ryegrass plants that set seed in the year of sowing. Both types are useful only as an annual forage crop in Saskatchewan as a result and are often collectively referred to as annual ryegrasses.

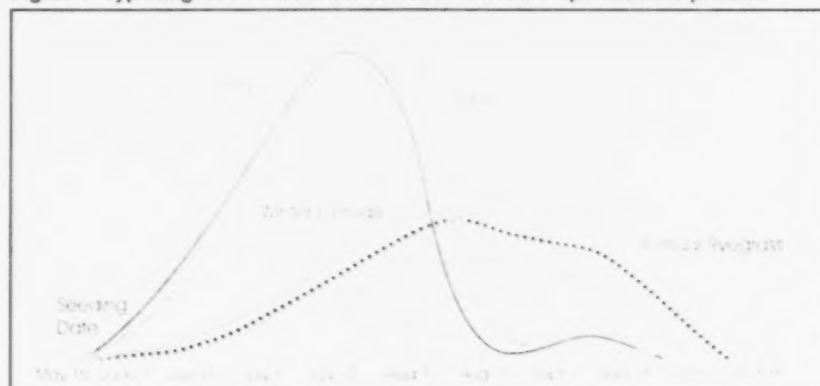
Annual ryegrasses are adapted to soil in the black and grey soil zones or to irrigated fields. They are noted for their ease of establishment, high forage quality, high yield and minimal management requirements. They are sometimes grown with small grains and, because of their good fall production, are an option for extending the grazing season (Figure 1).

Plant description

Annual ryegrasses are leafy, highly tillered grasses that can produce very well in the year of seeding but they will not overwinter in Saskatchewan. Italian types develop very few seed heads in the seeding year and remain leafy throughout the entire season. Westerwolds-types of annual ryegrasses are taller than the Italian types and will produce seed in the year of seeding. While more suitable for silage and hay than the lower-growing Italian ryegrasses, these annual ryegrasses are lower yielding than cereal crops. Over a three-year period at Melfort, when cut once for greenfeed in early August, ryegrass yielded 35 to 50 per cent of barley or oats. Annual ryegrasses can be difficult to cut for hay because of their low, leafy growth.

Roots of both types are very shallow and form a dense, fibrous mass about 5 cm (2 in) deep. Because of the shallow root system, they will not tolerate dry conditions. Annual ryegrasses produce well during the summer and fall, provided there is

Figure 1 Typical growth curves for common annual crops used for pasture



moisture and no competition from other plants. Growth continues later into the fall than perennial forages and other annual crops. (Figure 1)

Seeding

Annual ryegrasses should be seeded in mid- to late May into a firm, clean seedbed. If weed control is a concern, seeding can be delayed to late June. Like other grasses, they should be seeded shallow. With good moisture conditions, seeding to a depth of 2 cm (0.75 in) is appropriate. Deeper seeding to 3.5 cm (1.4 in) may be justified if the soil surface is dry.

Most sources indicate that the seeding rate of annual ryegrass should be between 25 to 30 seeds per linear foot of row on a one-foot row spacing (13 lb./acre), or 10 to 15 seeds per linear foot of row on a six-inch row spacing (12 lb./acre). It is suggested that producers increase the seeding rates by 10 per cent if broadcast seeding. Under irrigated conditions, the area to be sown should be watered immediately after seeding to ensure quick forage establishment.

Annual ryegrass seed does not flow well through most seed drill boxes. It may be necessary to use some form of seed box agitation or to mix the seed with a carrier or cover crop to ensure that the seed makes it into the ground.

Considerations in seeding

The following should be taken into account when seeding:

- prepare a fine, firm, weed-free seedbed;
- seed in mid-May to late June at a rate of 10-15 lb./acre to maximize yield (seeding rate depends on the variety and type of annual ryegrass seeded);
- control weeds by mowing or spraying with 2,4-D or MCP Amine where necessary; and
- fertilize at a similar rate as for a cereal crop.

Cover crops such as barley or oats can be used, but they should be cross-seeded and removed as greenfeed or silage. Use of a cover crop will reduce ryegrass production.

Cover crops

Where the annual ryegrass is to be used for fall grazing, a cover crop of oats or barley can be used. If a cover crop is used, it should be cross-seeded in alternate rows to the ryegrass. Tests by Agriculture and Agri-Food Canada at Melfort have indicated that annual ryegrass will produce very poorly if seeded in the same row as the cover crop. If the crop is seeded with an air seeder with wide sweeps, then maximum spread is desirable. Annual ryegrass yields, with and without either a cross-seeded barley or oats cover crop, are given in Table 1.

Table 1 Yields of annual ryegrass and three winter cereals (kg/ha) seeded with and without a barley or oats cover crop cut for silage at Melfort, Saskatchewan (Average 1994 and 1995)

Crop	Cover Crop		
	None	Barley	Oats
Annual Ryegrass			
Aubade	4500	2460	1835
Lemtal	3700	1105	1000
Maris Ledger	4685	1525	1270
Winter Cereals			
Fall Rye	2155	945	840
Winter Triticale	2985	1055	1360
Winter Wheat	2265	540	460

Annual ryegrass trials at the Melfort research station from 1996 to 1998 looked at the effect of companion crop on subsequent forage yields (Tables 2 and 3). The treatments were:

- no companion crop;
- wheat sown at 70 or 35 lb./acre; and
- barley sown at 60 or 30 lb./acre.

The no-cover crop treatment was harvested in August and again in October of each year. The cover crops were harvested for seed each year and the annual ryegrass regrowth was measured every October. The average yield of the Italian and Westerwolds without companion crop was 10,700 lb./acre over the three years of the trials.

The Italian and Westerwolds varieties experienced similar regrowth after the companion crops were removed for seed in the fall.

The regrowth yields of the Westerwolds after seed harvest of the companion crop were 1400, 1800, 1500 and 2000 lb./acre for the 70, 35, 60 and 30 lb./acre seeding rates,

respectively, when averaged over all cultivars and years (Table 4). The Westerwolds' yields ranged from 300 lb./acre in 1998, for the higher seeding rates, to 3320 lb./acre in 1997, for the lower seeding rate of the companion crop (data not shown).

If a cover crop is used, it should be removed early as either greenfeed or silage. This will allow the ryegrass time to develop before late fall. When late-summer grazing is desired, annual ryegrass should be seeded without a cover crop.

Weed control

Annual ryegrass does not establish as quickly as a cereal crop. Stands may be relatively thin and lack vigour for the first six to eight weeks making weed control critical.

There are very few herbicides that can be used in-crop and still allow the forage to be grazed. MCPA Amine, Ester or potassium and sodium salts can be used, but you must allow seven days after application before using the forage as

Table 2 Mean yield of Westerwolds ryegrass (Melfort Research Station, 1996-1998)

	Fall Yield (lb./acre)	No companion (percentage %)	Total Yield (lb./acre)
No companion crop	4000	100	10,700
Wheat – 70 lb./acre	1400	34	1400
Wheat – 35 lb./acre	1800	46	1800
Barley – 60 lb./acre	1500	37	1500
Barley – 30 lb./acre	2000	50	2000

Source: Dr. Bruce Coulman – Agriculture and Agri-Food Canada – Saskatoon Research Centre

Table 3 Mean yield of Italian ryegrass (Melfort Research Station, 1996-1998)

	Fall Yield (lb./acre)	No companion (percentage %)	Total Yield (lb./acre)
No companion crop	5000	100	10,700
Wheat – 70 lb./acre	1600	32	1600
Wheat – 35 lb./acre	2600	53	2600
Barley – 60 lb./acre	1600	32	1600
Barley – 30 lb./acre	2500	50	2500

Source: Dr. Bruce Coulman – Agriculture and Agri-Food Canada – Saskatoon Research Centre

Table 4 Italian Ryegrass Mean Yield (Melfort Research Station, 1998-2000)

Variety	Cut #1 (lb./acre)	Cut #2 (lb./acre)	Total Yield (lb./acre)	Maris Ledger
Maris Ledger	6000	2100	8200	100%
Meribel	4800	2200	7100	86%
Bartali	5500	2400	7800	96%
Barreextra	6500	2300	8700	106%
Lemtal	5900	2300	8200	100%
Mean	5800	2200	8000	

Source: Sask. Forage Council Variety Trials

Table 5 Westerwolds Ryegrass Mean Yield (Melfort Research Station, 1998-2000)

Variety	Cut #1	Cut #2	Total Yield	Aubrade
Agraco	5900	2300	8800	88%
Barspectra	5700	2700	8400	84%
SW WWR9016	7000	2800	9800	98%
Barwoltra	6700	2600	9300	93%
*Aubade	6000	4000	10,000	100%
Mean	6300	3000	9300	

*Note: Only two years of data (1999 and 2000).

Source: Sask. Forage Council Variety Trials

a feed. Assert 300 is registered for use on annual ryegrass crops grown for seed, but the forage cannot be used as a feed in the year of application.

For an up-to-date list of available herbicides, refer to the latest Crop Protection Guide available from Saskatchewan Agriculture, Food and Rural Revitalization.

When in-crop weed control is used, grazing or feeding restrictions must be considered.

Yield

In annual ryegrass forage trials conducted at Melfort by the Saskatchewan Forage Council from 1998 to 2000, Italian ryegrass yielded an average of 1300 lb./acre when combined over two harvesting operations (Table 4).

Westerwolds ryegrass yields were, on average, 2000 lb./acre higher than the Italian ryegrass at the same location (Table 5).

Fertility

Annual ryegrass crop responds well to fertilizer. Nitrogen and phosphorus should be applied at levels similar to that used for a cereal crop.

Incorporating fertilizer prior to planting is effective. If broadcasting, nitrogen could be applied prior to seeding or after the crop has reached the two- to three-leaf stage of growth.

If fertilizer is mixed with the seed, then a maximum of 15 lb./acre (13 kg/ha) of actual phosphorus in the form of a low nitrogen/high phosphate product may be seed placed.

Feed quality

Annual ryegrass is highly palatable and highly digestible. Feed tests of fall re-growth on stands cut in July show it has a similar nutrient level to oats and winter cereals, but this level persists later into the fall (Table 6). Fall re-growth yields of annual ryegrass are higher than oats, fall rye or winter wheat. This high fall production and quality makes annual ryegrass well suited to adding weight to weaned calves prior to marketing.

Annual ryegrass use can begin when the plants reach a height of eight to 10 inches. Livestock can generally graze up to 70 per cent of the plant without any detrimental effect to the crop. Allow three to five weeks for re-growth before turning the livestock out to pasture again.

Westerwolds-type ryegrass will set substantial amounts of seed by mid-August, which may produce volunteer plants in subsequent crop.

In order to prevent volunteer seed production, Westerwolds annual ryegrasses should be cut or grazed heavily enough to remove seed heads.

Cattle on lush annual ryegrass pasture should be given access to a bale of straw or hay to help control the rate of feed passage. If used for late fall or early winter pasture, it is important that the livestock have access to shelter from cold winds. Cattle should have access to water or a sufficient quantity of snow to meet their daily water requirement. To reduce trampling and fouling losses, fields should be fenced with a single-strand electric wire and the cattle rotated, or the field can be strip-grazed.

Plant diseases

Annual ryegrass diseases such as stem rust, ergot and loose smut have been reported in the United States. No significant incidences of disease have been reported in Saskatchewan.

Herd health concerns

Cattle grazing annual ryegrass are subject to the same health concerns as animals grazing many of the other annual and perennial forage crops.

Nitrate levels can be a concern in annual rye grass as they are with other annual crops. If plants are not growing vigorously in the fall due to frost or drought, nitrates can accumulate. Test any suspect stands prior to grazing or haying.

Grass tetany can be a problem for cattle on lush pasture. Lactating cows are most susceptible. Grass tetany is caused by a lower-than-normal level of magnesium in the blood stream. Animals put on lush pasture should receive magnesium supplements.

Atypical Interstitial Pneumonia (AIP) is another illness that can afflict cattle moved from low-quality or dry pasture to lush pasture. Animals may be found dead one or two weeks after being moved to a new pasture. The exact cause of this disease is unknown, and there is no known treatment.

Table 6 Chemical composition of grab samples of several forage species grazed at Melfort (Fall 1992)

Date	Oats	Fall Rye	Winter Wheat	Aubade ARG	Maris Ledger ARG
Oct. 5 Crude Protein	-	27.0	21.7	-	-
Acid Detergent Fibre	-	20.7	20.6	-	-
Oct. 13 Crude Protein	-	24.1	17.8	22.6	19.3
Acid Detergent Fibre	-	19.7	21.5	21.3	21.3
Oct. 20 Crude Protein	13.5	24.9	16.1	20.9	17.2
Acid Detergent Fibre	21.3	16.4	19.3	24.4	20.7
Oct. 28 Crude Protein	16.9	23.9	-	21.2	19.5
Acid Detergent Fibre	19.4	22.7	-	29.8	26.0
Nov. 3 Crude Protein	15.4	25.1	-	23.2	18.8
Acid Detergent Fibre	25.7	20.8	-	29.8	26.0
Nov. 9 Crude Protein	16.1	-	-	-	18.5
Acid Detergent Fibre	26.3	-	-	-	27.9

Sources of information and suggested reading

Testing of Forage Crop Cultivars/
Species For Adaptation and Yield.
Final Report of the Saskatchewan
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